ANALYSIS OF INFORMATION SOURCES AND COMUNICATION CHANNELS USED BY SOME SELECTED ACTORS IN POULTRY VALUE CHAIN IN NASARAWA STATE, NIGERIA

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ABSTRACT

The main objective of the study was to analyze the information sources and communication channels used by some selected actors in the poultry value chain in Nasarawa state. Multistage sampling procedure was used to draw 140 actors in the poultry value chain business as study sample. Stage 1 Two (2) Local Government Areas (LGAs) well known for poultry production were purposively selected from each of the three agricultural zones in the state. Stage 2: Thirty percent (30%) of the identified participants in each value chain category were selected using proportional sampling technique to select 140 respondents. The data collection was through the aid of a structured questionnaire. Data were subjected to both descriptive and inferential analyses. Descriptive statistics was used to analyze objectives 1, 2, 3, 4 and 6 while multiple linear regression model was used to analyze objective 5. Results showed that the mean age of the respondents was 42 years. Results shows that majority (86.5%) of the poultry farmers had some formal education, 51.6% of the poultry inputs dealers had some formal education, (96.2%) of the poultry products marketers had had some formal education while (88.9%) of the veterinary workers had had some formal. The mean years of experience of the respondents were eight (8) years. The mean annual poultry income of respondents was ₦1, 586,142.50. The results show that majority (62.2%) of poultry farmers got their information from fellow farmers, majority 74.2% of poultry inputs dealers got their information from veterinary officers, and 57.7% poultry products marketers got their information from fellow marketers while majority (66.7%) of veterinary workers got their information from neighbours. Majority (79.7%), (90.3%) sand (96.2%) of the poultry farmers, poultry inputs dealers and poultry product marketers in the study area used face-to-face communication channel most frequently. All (100.0%) of veterinary officers used telephone calls most frequently. The regression analysis revealed that the coefficient of determination (R^2) for poultry farmers was 0.588. The coefficient of determination (R^2) value for poultry inputs dealers was 0.513. The coefficient of determination (R^2) value for poultry product marketing was 0.461. The results for veterinary officers show that the coefficient of determination (R^2) value was 0.341. the determinants of utilization of modern communication channels for poultry farmers were the variables of annual income (sig.=0.000), level of education (sig.=0.002) and number of extension contacts (sig.=0.005). The variables of level of education (sig.=0.003) and poultry enterprise experience (sig.=0.003) were the determinants of adoption of ICTs for business communication by poultry inputs dealers. The variable of annual income (sig.=0.000) was the determinant of level of utilization of modern communication channels by poultry product marketers and veterinary officers. The results on constraints show that poultry farmers ($\bar{x}$=2.4), poultry inputs dealers ($\bar{x}$=2.4), poultry products marketers ($\bar{x}$=2.4) and veterinary officers ($\bar{x}$=2.2) all perceived erratic power supply, high cost of ICT facilities and poor network from service providers as serious major constraints. It was concluded that the level of utilisation of modern communication facilities (ICTs) was very low. It was recommended that constant power supply should be provided in all rural and urban communities by the electricity companies to enhance efficient operation of ICT facilities for business communication.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

A value chain is a set of activities that a firm operating in a specific industry performs in order to deliver a valuable product or service for the market. Value chain activities bring products from its conception to its end user and include production, marketing and distribution which may be confined to a single geographical location or spread over a large area (Porter 1985).

Poultry value chains describe the processes through which birds and other inputs pass during the production process, including information on the place each process occurs and on the people involved.

The actors in the poultry value chain include producers of poultry feeds and equipment, dealers of veterinary drugs, poultry breeders and hatchery operators of all sizes, poultry farmers, Veterinarians and poultry advisory service providers, transporters and distributors of poultry products, processors and marketers of poultry birds and their products among others. However, this study will be limited to the analysis of communication channels and networks among the following participants in the poultry value chain:

i) Dealers of poultry inputs (Feeds, drugs and equipment)

ii) Poultry farmers

iii) Marketers of poultry products

iv) Veterinarians and Advisory service providers

Information is fundamental to our way of life and agriculture is no exception. Farmers need access to reliable information and knowledge along the value chain to improve their productivity.

Information sources and channels available to poultry farmers include libraries, internet, extension agents, research organizations, radio, television, community based organizations, neighbours, family, fellow farmers (farmer to farmer communication), cooperative groups and societies, traders, etc. (Ngathou, Bukenya, and Chembezi, 2006; Daudu, Chado, and Igbashal, 2009; and Mwalukasa, 2013). In view of the rapid growth and expansion of communication technologies there has been a lot of research in the area of communication and agricultural development.

Agricultural communication is the transfer of Agricultural technological innovation from technology developers (e.g. research institutes, universities, private organization, etc) through transfer agencies to the farmers. In broad sense, it is the identification and utilization of appropriate expertise in the development process that will assist in increasing participation of intended beneficiaries at the grassroots level (Nwachukwu , 2017).

. The introduction of social media and web 2.0 applications has opened up platform that agricultural extension officer's, farmers, agricultural institutions and nongovernmental institutions utilize to disseminate and exchange agricultural information. Social media is increasingly being used as a medium of sharing information and creating awareness. Platforms such as Facebook, Twitter, YouTube and blogs have been used to engage with various audiences. The users generate and shape the content. Social media strengths are

complementing traditional media in facilitating the shaping of content (Kipkurgat *et al.*, 2016).

Poultry is a term used for any kind of domesticated bird, captive-raised for its utility Domesticated fowl collectively, especially those valued for their meat and eggs, namely; chickens, turkeys, ducks, geese, and guinea fowl. Worldwide, more chickens are kept than any other type of poultry, with over 50 billion birds being raised each year as a source of meat and eggs. Traditionally, such birds would have been kept extensively in small flocks, foraging during the day and housed at night. This is still the case in developing countries, where the women often make important contributions to family livelihoods through keeping poultry. However, rising world populations and urbanization have led to the bulk of production being in larger, more intensive specialist units. These are often situated close to where the feed is grown or near to where the meat is needed, and result in cheap, safe food being made available for urban communities. Profitability of production depends very much on the price of feed, which has been rising. High feed costs could limit further development of poultry production.

Poultry products are highly nutritious and of enormous economic benefit to man both at homes and industries. Apart from meat, poultry egg serves as a good source of animal protein, lipids and vitamins of high biological value to man. This study is however limited to broiler and layer chicken value chain activities in Nasarawa State, Nigeria.

1.2 Problem statement

Poultry farming is one among the important agricultural sectors for food and cash generation in Nigeria but less attention has been given to identify the challenges and prospects of poultry industry. Poultry production has been narrowing in terms of participation despite the fact that the industry is one of livestock production having convenient environment and access to market as

well as highly demanded throughout the world and in Nigeria in particular. Unlike the other types of livestock product, poultry product is easy to enter in the market because it demands low capital in both financial and land resources. However due to lack of proper and adequate information as well as communication gap between the poultry farmers, researchers and the extension workers the sector is still in low supply of poultry products to market. Lack of effective communication channels among poultry farmers has been a constraint that led to decline in production trends which in return led to deficit in supply to meet the rising population consumption demand. There is lack of adequate access to information about the supply or availability of facilities or incentives for poultry production in order to achieve the desired change in the industry.

Poultry as a commercially viable business, the poultry industry, with about the longest value chain in all of Nigeria's agriculture, will benefit greatly with incorporation of ICTs into the business by actors across the value chain (Nwalieji *et al.*, 2019). Information Communication Technology incorporation to the several levels of poultry value chain can have amazing effects on the overall outlook of poultry business and boost its potential. Available ICTs have not been incorporated properly into the poultry business communication frontier in order to gain the full advantage of its boundless effects of increasing the efficiency of business communication. The knowledge base of different actors across the value chain and their level of usage of ICTs of different forms into their daily business influence the level to which different forms of ICTs are utilised. Usage of ICTs by poultry value chain actors for business communication can also be determined by a number of factors including the relative advantages derived from complexity or simplicity of the technology among others. It is in line with this that the study is designed to address the following research questions.

1.3 Research questions

This study was designed to provide answers to the following research questions:

i. What are the socioeconomic characteristics of the various actors in the poultry value chain in Nasarawa state?

ii. What are the sources of information on poultry value chain activities most frequently used by respondents?

iii. What are the channels of communications most frequently used by the various actors in the value chain in the study area?

iv. What is the level of utilization of the modern communication channels (ICTs and social media platforms) by the respondents?

v. What are the effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels (ICTs and social media platforms)?

vi. What are the constraints to the use of modern ICTs for communication by the actors in the poultry value chain?

1.4 Objectives of the study

The main objective of the study was to analyses the information sources and communication channels used by actors in the poultry value chain in Nasarawa state. The specific objectives are to:

i. describe the socioeconomic characteristics of the actors in the poultry value chain in Nasarawa state;

ii. identify the sources of information most frequently used by respondents;

iii. ascertain the channels of communications most frequently used by the various actors in the value chain in the study area;

iv. determine the level of utilization of the modern communication channels (ICTs and social media platforms) by the respondents;

v. determine the effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels (ICTs and social media platforms), and;

vi. Identify the constraints to the use of modern ICTs for communication by the respondents in the study area.

1.5 Justification of the study

It is essential that the outcome of this research work will be of benefit to actors in the poultry value chain as well as the researchers, Extension workers, Government both federal, state, and Local governments. First and foremost, it will create awareness to actors in poultry value change about improved technologies in all aspect of the poultry production which were not been explored, it will also lead to diffusion of information and communication among the actors in the poultry value change in Nasarawa State. Secondly, the outcomes of this research or study would infinitely spur government, policy makers, to formulate a realistic policy and programmed that are likely to enhance and improve poultry production in the country. Thirdly the findings of this study would attract attention of the Government to develop the right political will that is sine qua non to enforce implementation of Agricultural policies that are likely to enhance poultry production in the country, it would awaken extension workers from their laisser faire

attitudes toward their work by exploring their strengths and weaknesses, in which they can become better informed and consequently think of using various information and communication teaching method in diffusion of communication in improved Agricultural technologies to the end users, most of whom are resource poor farmers.

1.6 Scope and Limitation of the study

This study covers analysis of information sources and communication channels used by Actors in poultry value change in Nasarawa state.

1.7 Definition of operational terms

Information: Information is defined as one or more statements or facts that are received by a human and that have some form of worth to the recipient.

Information source: Information source is a person, or place from which information comes, arises, or is obtained.

Communication: Communication is a process by which information is exchanged between individuals through a common system of symbols, signs or behaviours.

Communication channel: Communication channel is the means by which messages travel from a source to a receiver (Jitendra Chauhan, 2007).

Agricultural communication: Agricultural communication is the transfer of Agricultural technological innovation from technology developers to the farmers.

Poultry: Poultry is a term used for any kind of domesticated bird, captive-raised for its utility .

Poultry value chain: Poultry value chain can be defined as the full range of activities required to bring a product (e.g. live animals, meat, milk, eggs, leather, fiber, manure) to

final consumers passing through the different phases of production, processing and delivery.

Actors in poultry value chain: The actors in the poultry value chain are producers of poultry feeds and equipment, dealers of veterinary drugs, poultry breeders and hatchery operators of all sizes, poultry farmers, veterinarians and poultry advisory service providers, transporters and distributors of poultry products, processors and marketers of poultry birds and their products among others.

CHAPTER TWO
LITERATURE REVIEW

Literatures were reviewed under the following headings:

2.1 Conceptual framework

2.1.1 Concept of rural youths

2.1.2 Concept of participation

2.1.3 Rural youth participation in crop production enterprise

2.1.4 Concept and types of crop production enterprises

2.2. Theoretical Framework

2.2.1 Gratification theory

2.2.2. Social network theory

2.3 Empirical Review

2.3.1 Socio-economic characteristics of respondents

2.3.2 Sources of information most frequently used by respondents

2.3.3 Channels of communications most frequently used by the various actors in the value chain in the study area

2.3.4 Level of utilization of the modern communication channels (ICTs and social media platforms) by the respondents

2.3.5 Effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels (ICTs and social media platforms)

2.3.6 Constraints to the use of modern ICTs for communication by the respondents in study area

2.1 Conceptual Framework

The study used a combination of modified frameworks by Ospina and Heeks (2012). The framework looks into various characteristics that determine the use of ICTs. Since the farmer is an essential component in the information system of a farm, the decision to use ICTs often depends on the personal characteristics of the farmer, such as his or her personality, experience, age, education, goals and objectives. Ospina and Heeks (2012) used the model on dairy farmers to determine whether the adoption and use of computers by the farmers was determined by some characteristics or variables. The model is useful for this study because actors in poultry value chain business usage of ICTs facilities will be assessed. This study used the framework to analysis Information Sources and Communication Channels used by some selected Actors in poultry value chain in Nasarawa State, Nigeria.

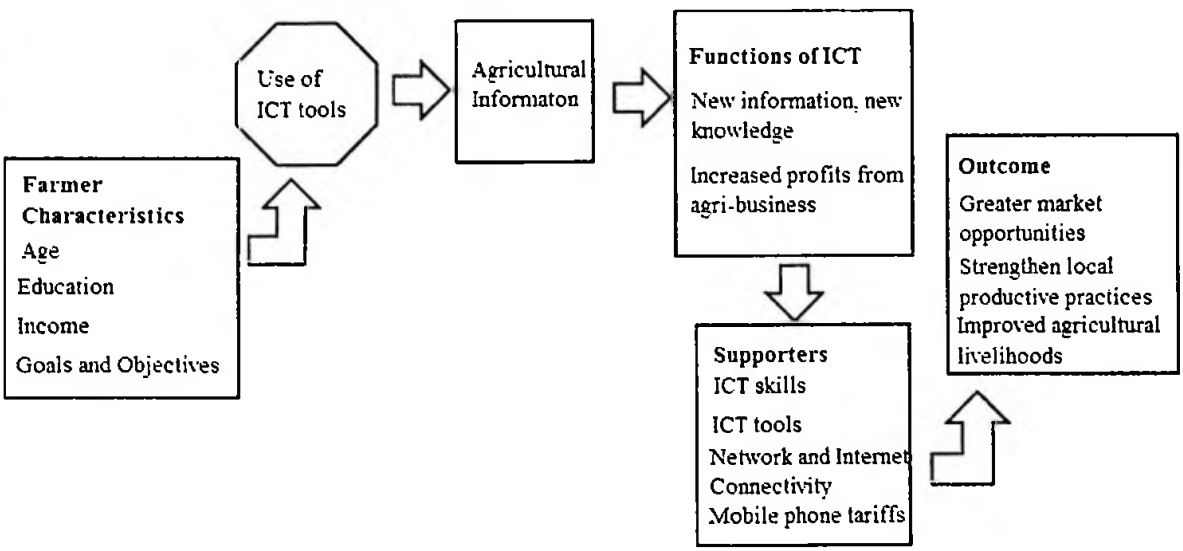


Figure 2.1: Conceptual framework for analysing the use of modern communication channels (ICTs) by actors in the poultry value chain.
Source: Ospina and Heeks (Ospina and Heeks, 2012)

2.1.1 The concept of agricultural information

Information is a processed and organized data for meaningful purpose which could be in different forms or sources (Adio *et al.*, 2016). Every rational person needs some form of information for his / her day to day activities. Therefore, an emphasis on agricultural information importance cannot be overruled, because information had been described as man's accumulated knowledge in all subjects, in all forms and from all sources that could help users of such information to improve and develop intellectually on their activities. There is no doubt that information is very important in all aspects of agricultural development from planning to the production stage in the farm. It is obvious that those factors that limit agricultural information development are the difficulties in accessing information for research and development activities. Agricultural information is supposed to be made available to research scientists, extension workers, farmers and other users, so that they can all engage in agricultural development and food production. Tadesse (2008) defined agricultural information as the various sets of information and messages that are relevant to agricultural production activities of farmers such as crop production and protection, animal production and management, and natural resource production and conservation. For the purpose of this study agricultural information therefore refers to agriculture related data which are transformed into meaningful and useful contexts or forms for effective decision making in agriculture or farming related activities. Agricultural information services contribute significantly to agricultural production. Through agricultural information farmers can adopt new technologies or farming systems, know when to plant and harvest, which crop to produce and which animal to rear and where to sell. It is also through agricultural information that farmers can know

where to acquire bank loans and other farming inputs, as well as how to control pests and diseases. Such information will consequently increase agricultural production and improve the standard of living of farmers.

There are various types of information on agriculture related activities. These could include information on crop production and protection, livestock production, agro-forestry, pest and diseases control, fertilizer availability and application, agricultural credit facilities, market prices, improved seeds varieties, rainfall gauge and so on. Oduwale and Ikhizma (2003) identified various types of agricultural information, such as information on pest and diseases control, services available from government and private organizations, marketing farm produce, credit and loan facilities to farmers, and utilization of fertilizer among others. Aina, Kaniki, Ojambo (1995) and Ekoja (2000) define agricultural information as published and unpublished knowledge on all aspects of agriculture which are inter disciplinary in nature and have universal application. They classified the types of agricultural information into the following categories:

i. Technical/scientific information: This type of information is obtained from researches and development work conducted in universities, agricultural research institutes, agricultural colleges and private agricultural research organizations.

ii. Commercial information: Information under this category gives enlightenment on the marketing of agricultural produce in order to maximize profits.

iii. Socio/cultural information: This involves information on traditional agricultural practices, local cultures, norms/values and background information and training done in different communities as well as on the availability of labour.

iv. Legal information: This type of information educates all stakeholders in agriculture on legislated laws on production and distribution of agricultural produce.

v. Information on rural women: This type of information will be useful to train rural women on proven technology in agriculture, food production, processing, and preservation, storage, utilization and marketing and how to improve their standard economically, and socially.

vi. General Information: These are information of general interest to farmers for example handling of flood, fire and other disasters.

2.1.2 Concept of Communication Channels

The concept of 'use' of communication channels or media is of great importance because the knowledge of it will provide keys for understanding and predicting outcomes of communication process. Exposure to (or use of) various communication media or channels is a precondition for any effect of media content on people to occur. It seems right to state that the influence of any medium in a communication situation or on the message depends not merely on the type of media but also on how it is used, or the use to which it is put. Communication channel works as physical bridge between communication source (the sender) and receiver. According to Rogers and Shoemaker (1971) in Jitendra (2007), communication channel are the means by which messages travel from a source to a receiver.

Information sources and channels available to farmers include libraries, internet, extension agents, research organizations, radio, television, community based organizations, neighbours, family, fellow farmers (farmer to farmer communication), cooperative groups and societies, traders, etc. (Ngathou, Bukenya, & Chembezi, 2006;

Daudu, Chado, & Igbashal, 2009; and Mwalukasa, 2013). In view of the rapid growth and expansion of communication technologies there has been a lot of research in the area of communication and agricultural development. However, the focal point of researchers has been geared towards modern communication media, and how these can contribute to improving access to agricultural information. On the other hand, interpersonal communication is invaluable to communication among the rural folk who incidentally are at the core of agriculture.

Mass media, commercials and government agencies and agents as well as the personal contact have assumed a major function of disseminating information about farm matters with other farmers, friends and relatives. Agricultural information is necessary if farmers have to advance beyond their present level of production, a steady flow of accurate, understandable, factual information links the scientist with the farmer through the various sources that communicate such information (Achebe and Lucky, 2013). The channels used by farmers include the mass media channels such as radio, television, newspapers, farmers' magazines, leaflet and posters, from government or commercial sources. There is also personal contact with extension workers and representatives of commercial firms either on an individual basis or in small groups. This may include exhibitions, seminars, workshops or demonstrations. There could also be personal contacts with other farmers (Adam, 2002).

According to Inagaka (2007), communication for development, as in the agricultural sector is presented with a multitude of communication approaches and techniques that can be adopted to pursue specific goals. Some of the strategies adopted include: entertainment-education, marital partners; peer education; interpersonal communication;

community actions; media advocacy or even listening to indigenous music. Age, Obinne and Demenongu (2012) define communication channels as the means through which messages travel from the source to the receiver and vice versa. Some of the communication channels used in disseminating agricultural information include personal contacts; radio broadcasts; publications; field days; agricultural shows; demonstrations etc.

Ithiel (1983) stated that in the traditional societies, traditional forms of communication like folk songs, plays and sermon have credibility and meaningfulness which cannot be equalled with imported technologies. Over the years, different organization, both local and international have produced content targeting extension offices and farmers for the purposes of improving agricultural production.

The information sources for farmers depend on the type of work and services they perform. Information sources are tools or information carriers that meet the information needs of extension workers. Many studies have been conducted to determine the type of information sources of agricultural extension workers. Alfred and Odefadehan (2007) identified various information sources of extension workers to include organizations, individual associates, local, national and international seminars, workers, trainings, print and electronic media, telecommunication, and internet service.

Koyenikan (2011) categorized the above mentioned information sources as formal and informal sources. According to him, the formal sources include state radio stations, local and international print media (such as newspapers, newsletters, and journals) and seminars/workshop, while the informal sources are farmers, family friends and personal assessments and judgment. Another related study carried out by Farooq *et al.* (2010)

specifically highlighted the role of Agricultural Research Institutes and Agricultural Officers as information sources while Rama and Joan (1996) identified agent in the office, agents in other countries, extension specialists, immediate supervisor, news agencies, state/federal agencies, school teachers and administrators as prominent information sources to agricultural extension workers. However, Mugwisi, Ocholla and Mostert (2012), after emphasizing the position of libraries, internet, colleagues, personal and departmental collections, workshops and seminars, argued that farmers preferred print sources face to face interaction.

According to Ajuwon and Odeku (2012), information sources come in great diversity and various forms such as print and non-print forms. Print connotes books, periodicals, bibliographies, maps, indexes and abstracts, photographs, government documents, technical reports etc. It can also be in electronic form. Non-print materials include audio visual, multimedia, microfilms, electronic books, journals, images, texts/records from the internet, web documents etc. These information sources can be found in human archives, libraries and the internet.

In an era of knowledge economy, information plays an increasingly important role in every sphere of the developmental process. Aina (1991) stated that farmers need agricultural information for the purpose of understanding how to apply fertilizers, insecticides for pests and disease control, planting materials, and credits and loans. Information is fundamental to our way of life and agriculture is no exception. Farmers need.

Several studies highlight the potential of interpersonal communication. For instance, Licht & Martin (2007), Lwoga, Stilwell, Ogbama (2010), Ngulube (2011), and Okwu and

Daudu (2011) realized that friends, relatives and neighbours are regularly available and accessible to the farmers to gain the agriculture information they need. According to Leeuwis (2013), to a large extent the dynamics of diffusion methods rely on horizontal communication among farmers. Farmers scrutinize and have their perception of other farmers' skills, practices and performance, and they discover more by discussing their own experiences with friends and neighbors. Opinion leaders, who are also local farmers, are good sources of new information and advice. They usually enjoy considerable authority on the way other locals think and behave (Rogers, 2003). The argument that rural farmers prefer farmer-to-farmer communication is supported by several studies that indicate that even in communities where social organisation and infrastructure exist, farmers favor their colleague farmers as their prime information source (Demiryurek, 2008). In their study on the effectiveness of the farmer-to-farmer extension approach in Uganda, Ssemakula and Mutimba (2011) also found that there was a high level of communication between farmers compared to what existed between the farmers and any other individuals or extension service providers.

2.1.3 Importance of Communication in Agriculture

For each type of development such as social, economic, religious, political and educational, communication has its important place. Similarly for the all round development of agriculture the communication process also deserves its significant role. Farming is an ancient occupation. If the farming may be recognized only as a factory of producing the food grains there is no difference between the ancient time and modern time farming. Other productions there are needed factors as land, labour, money and management which are still in the present and were in the past also. Now, what is the

modern farming? The modern farming is that in which the person adopts the latest new methods of farming based on science for the agricultural production. Thus for the modern agriculture there is need of one more factor and this factor is the latest knowledge. Thus, in the modern agriculture for the agricultural production along with the four factors one more factor of the latest knowledge (fifth) has been added. The question arises from where this new knowledge may be achieved? The first need is that to create the new knowledge and the second need is to send this latest knowledge to the farmers.

Yaseen *et al.* (2016). Information sources are various means by which information is recorded for use by an individual and organization. Sources of agricultural information are: radio, television, extension workers, cooperative societies, friends and colleagues, newspapers and magazines, books/leaflets, phones, libraries and institutes. Also, observation of people organizations, speeches, documents, picture and art work can also be described as information sources Adio *et al.* (2016).

Thus for the modern farming three tools are needed. If the middle part or the Agriculture Extension and information tool may be replaced the latest knowledge cannot reach the farmers and its result will be obstacle in the progress of farming. Thus, we see that for the modernization of farming the communication process has its special contribution (Jitendra Chauhan, 2007).

2.1.4 Poultry value chain

Graeme *et al.* (2012) defined Value Chain as a sequence of related enterprises conducting activities so as to add value to a product from its primary production through its processing and marketing to the final sale of the product to consumers (End markets). This can simply be put as Value adding activities which are routinely undertaken at

micro, meso and macro levels. Livestock Value Chain therefore functions as each link in the chain, involving sourcing inputs, making/producing, and then delivering/selling product to the next link in the chain.

2.2 Theoretical Framework

2.2.1 Gratification theory

Gratification theory perceives messages recipient as one, who selectively chooses, attends to, perceives and retains the media messages on the basis of his/her needs. The focus was thus shifted from media production and transmission functions to the media consumption functioning. The theory acknowledges that users are goal driven decision-makers who select information communication channels that meet their needs.

2.2.2. Social network theory

The social network theory forms the basis of the theoretical framework from which the study was derived. The theory views social relations basically in terms of nodes and ties. The nodes correspond to individual actors while the ties stand for the relationships or linkages between the actors. The focal point of network analysis is to identify the relationships between people. This method focuses on informal relationships, indicating how existing informal interactions ease or hinder the transfer of information and knowledge or more concrete items such as commodities and currency. By expressing these interactions in the form of sociograms (a graph that depicts the social relations in a group), network analysis helps to reveal the unofficial communication patterns that exist in a community, group or organization. Social network analysis has been applied in a wide range of academic disciplines such as anthropology, business studies,

communication studies, information science, organizational studies, development studies and literature studies (De Nooy, 2003).

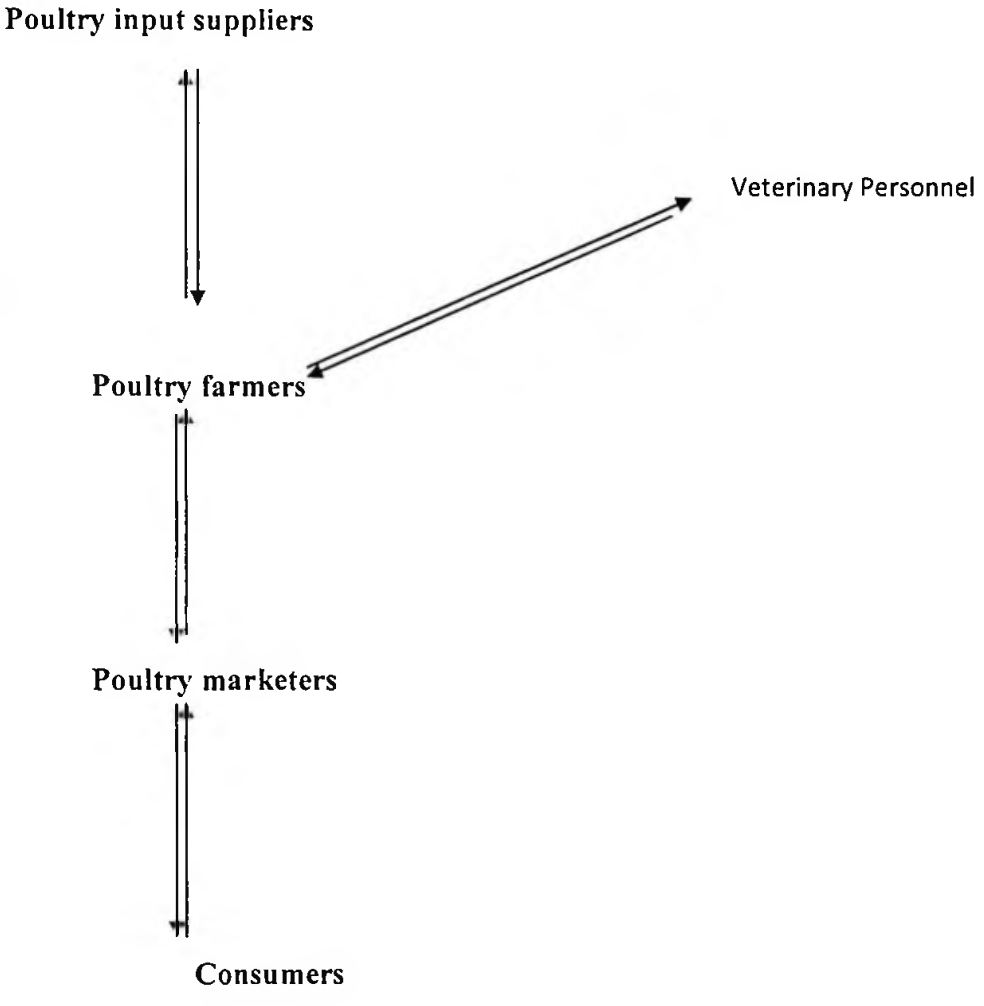


Fig. 2.2: Communication Network between Actors in Poultry Value Chain

Source: Field Survey, 2019

2.3 Empirical Review

2.3.1 Socio-economic characteristics of respondents.

Nwalieji, *et al.* (2019) carried out a study on Mass Media Utilization by Poultry Farmers in Anambra State, Nigeria. Results revealed that 39.1% of the respondents were within the age range of 20-29 years while the mean age was 33.8years. This implies that young people of economically active age, constitute the greater population of poultry farmers. Greater proportions (50.8%) of the poultry farmers were male. This result implies that more men are involved in poultry production than women.

Majority (54.5%) of the respondents were married. This implies that married people accounts for the majority of poultry farmers. The greater proportion (37.1%) of the respondents completed secondary school. This implies that poultry farmers in the area are educated and are likely to access agricultural information disseminated through various mass media channels or forms. Majority (59.2%) had 1-5 persons and the mean household size was 5 persons. This is an indication that poultry farmers have a fair household size which could probably supply the needed farm labour. The majority (80.8%) of the respondents had 1-5 years of farming experience, while the mean farming experience was 3years. This implies that greater number of the respondents have not been into poultry farming for a long time.

Results further reveals that56.7% accounted for no extension visit at all in the last one year, and the mean number of visits was 2 times. This is very poor, considering that poultry farming is an information dependent venture. This result is in accordance with the findings of Nwalieji, *et al.* (2019) who opined that inadequate extension contacts is one of the major constraints faced by poultry farmers in Nigeria. The majority (68.3%) of the

farmers kept below 100% of birds, and the mean number of birds reared was 114birds. This result implies that most of the poultry farmers are small scale farmers. This agreed with the report of Olagunju and Babatunde (2011) that the population of Nigerian that engaged in poultry production are mostly subsistence and small or medium sized farms. Results show that majority (70.8%) of the farmers earned between N1,000,000 – N1,200,000 per year and the mean income was N1,026 008, 450. This implies that the farmers that engage in poultry production earn reasonable income which will better their life.

Goni *et al.* (2013) revealed that membership of cooperative societies has advantages of ensuring that members derive benefits from the groups such that could not be derived individually. Adeyonu *et al.* (2016). revealed that about 14% of the poultry farmers in the study area were below the age of 30 years, while about 40% were older than 49 years with mean age of about 44 years. This means that the respondents were fairly old but still economically active. About 75% of the farmers were males. This may be attributed to the fact that poultry enterprise is a highly risky venture, labour intensive and characterized by uncertainties which in most cases can only be handled by men. The findings concur with those (Babalola (2014) who reported that the majority of poultry farmers in Nigeria were males. All the poultry farmers in the study area had formal education, with over 50% having tertiary education. This implies that there is high literacy level among poultry farmers in Oyo state. This is expected to have positive influence on their decision to participate in insurance policy.

Furthermore, the mean years of experience of poultry farmers in the study area was 13.5. This indicates that the respondents have stayed relatively long enough for them to have

gained practical experience about some of the risks and uncertainties associated with poultry production. Given the high risks and uncertainties that poultry farming is associated with, high literacy level coupled with farmers experience in poultry farming is expected to have positive impact on their decision to participate in NAIS.

Close to 75% of the farmers belonged to one or more association such as Poultry Association of Nigeria and cooperative societies. This may however have a positive effect on their willingness to participate in NAIS because the two associations as well as others would be useful channels of informing and educating their members about government policies.

Less than 36% of the respondents had access to extension services. This may be responsible for the low adoption of NAIS by the poultry farmers. Babalola (2014) also reported low participation of poultry farmers in NAIS. The major pre-occupation of the extension worker is the education of farmers about government policies and their effects on their farming business. That the farmers were not adequately covered by the extension agents may be partly due to high farmer extension worker ratio in the country.

Otunaiya *et al.* (2007) revealed in his study that majority (68%) of the respondents had mean experience in poultry farming. Otunaiya *et al.* (2007) implied that the more experienced a poultry farmer is, the more efficient he would be in management because the acquired experience over the years would be brought to bear on the production activities. Bello *et al.* (2014) conducted a research on Analysis of Youth Involvement in Rice Production in Lafia Local Government Area of Nasarawa State in Central Nigeria. Results revealed that only (46%) had access to credit.This implies that respondents in the study area had difficulty in accessing loan from financial institutions. The implication of

this is that it will be very difficult for poultry farmers to go into large scale business because they cannot afford necessary inputs which can enhance productivity. Bello *et al.*(2014)) in their study on Analysis of Youth Involvement in Rice Production in Lafia Local Government Area of Nasarawa State in Central Nigeria inferred that accessibility to credit would encourage youths' involvement in agricultural production.

Oladeji (2011) conducted a research on sources and utilization of poultry production information among poultry farmers in Oyo State. The personal characteristics examined included age, level of education, religion, primary occupation, membership of poultry association, years of experience, scale of operation respondents' years of experience, and respondents' type of stock. The results revealed that majority were within age range 31 to 50 years, 83.3% were male while all of them could read and write. This is an indication that all the farmers can benefit from the print media source of communication. The results further showed that the primary occupation of majority of farmers was poultry production while 24.1% had occupation such as trading, civil service and clergy as their primary occupation. This showed that poultry production can be relied upon as a major source of income for the family.

However, 83.3% of the farmers did not belong to any poultry association indicating that the association had no benefits to the farmers hence, reason why they were reluctant to be members of poultry association. Fifty percent of them had between 1 and 5 years of experience as poultry farmers while 34% had while 34% had over 6 to 10 years of experience, an indication that they were experienced, which may be a reason while poultry farmers were reluctant to be members of poultry association. This is because their wealth of experience is much to rely upon for knowledge and act upon for poultry

practices than joining poultry association for possible assistance. As regards farmers' year of experience in poultry production, a larger proportion (50%) of them had 1 to 5 years of experience, 34% had 6 to 10 years while 10% had 11 to 15 years of experience and 57% of the poultry farmers had large scale of production while the remaining 42% had low scale production.

The result of the socio-economic characteristics revealed that majority (77.33%) were female while 22.67% were male. This implies that cassava production is dominated by female farmers. This finding is in line with the observation of Olayemi *et al.* (2012) who opined that women are known to be more involved in agricultural activities than men in sub-Saharan Africa countries, including cassava production. The result also indicated that most (39.33%) of the respondents were within their productive age bracket of 41-50 years and the mean age was found to be 42.31 years. This is an indication that cassava production is mainly done by young people who are active and within their productive age group. This finding is similar to that of Ezeh (2013) who reported that people within this age range constitute the major work force that can be productive.

The result further indicated that majority (70.67%) of the respondents were married while only 19.33% and 10.00% were single and divorced respectively. This is an indication that the respondents should be careful in the use of appropriate information retrieved from different information and communication technology (ICT) in respect of cassava production, in order to meet up with the family responsibilities. Also the result revealed that the respondents had acquired a wide range of farming experience as a higher percentage (35.33%) had between 11 to 20 years of farming experience with a mean year of farming experience of 18.5 years. This finding is in consonance with Ezeh (2013) who

reported that the higher the farming experience, the more the farmer would have gained more knowledge and technological ideas on how to tackle farm production problems and the higher would be his output and income. Also a greater proportion (40.00%) indicated high number of household size with mean average of 9 persons. This implies that the respondents had reasonable family labour that could help in farming activities. Household size in traditional agriculture determines the availability of labour and level of production (Ani, 2004).

2.3.2 Source of information

According to Msoffe and Ngulube (2016) 81% percent of the poultry farmers stocked layer birds, an indication that they reared poultry birds for commercial egg production. The sources of information on poultry keeping recommended practices available to farmers were veterinary officer, television, poultry association, agricultural extension agents, workshop/seminar, journals/magazines and family. A higher percentage (32.4%) of the farmers became aware of the recommended practices through the veterinary officers. On accessibility of farmers to information, 50.9% always had access to poultry information while 22.2 and 26.9% had access to information rarely and moderately respectively. This shows that a larger percentage of the poultry farmers had access to poultry information and hence they were expected to have better production practices. 96.3% said their source of awareness of poultry production practices is radio, 94.4% chose family and friends, 84.3% chose television, 72.0% chose veterinary officers, 69.4% chose feed millers while 59.3% chose clergy. Only a few got aware of information through extension agents. This is an indication that extension agents in the area had not been disseminating information on poultry production. On preferred source of

information, radio ranked the first, followed by family/friends, television, veterinary officers and poultry medicine sellers , extension agents and feed millers, poultry associations and workshops/seminars were ranked least in that order. It is also, showed that family/friends is the most accessible source of information to poultry farmers followed by radio, television, feed millers, poultry drug dealers, poultry association, veterinary officers, workshops while extension agents were the least accessible source of information to poultry farmers. However, it further shows that 57.4% of the poultry farmers always use radio as source of information while 67.6% seldom use family and friends as source of information.

Moreover, majority of the farmers who had extension agents and workshops as their sources of information did not make use of information obtained. Inadequate capital was a severe problem to poultry farmers while other problems such as the problem of getting quality feeds, diseases and pests, pilfering and theft were partially severe problem. However, insufficient water, inadequate labour supply and inadequate land were not severe at all. The level of use of information among poultry farmers was very high with 39.8% while 30.6% said it was very low.

Several studies have highlighted the potentials of interpersonal communication. For instance, Licht and Martin (2007), Lwoga, Stilwell and Ogbama (2010), Ngulube (2011), and Okwu and Daudu (2011) realized that friends, relatives and neighbours are regularly available and accessible to the farmers to gain the agriculture information they need. According to Leeuwis (2013), to a large extent the dynamics of diffusion methods rely on horizontal communication among farmers. Farmers scrutinize and have their perception of other farmers' skills, practices and performance, and they discover more by discussing

their own experiences with friends and neighbours. Opinion leaders, who are also local farmers, are good sources of new information and advice. They usually enjoy considerable authority on the way other locals think and behave (Rogers, 2003). The argument that rural farmers prefer farmer- to farmer communication is supported by several studies that indicate that even in communities where social organisation and infrastructure exist, farmers favour their colleague farmers as their prime information source (Demiryurek, 2008). In their study on the effectiveness of the farmer to-farmer extension approach in Uganda, Semakula and Mutimba (2011) also found that there was a high level of communication between farmers compared to what existed between the farmers and any other individuals or extension service providers.

2.3.3 Channels of communication

Okwu and Daudu (2011) conducted a study and find out that interpersonal channels were generally more available and accessible to the farmers within the IPCs, friends/neighbours/relations were the most regularly available/accessible interpersonal channels of communication (45.89%), followed by extension agents (38.61%). About 31% of the farmers mentioned contact farmers as regularly available and accessible to them as source of agricultural information and 22% indicated opinion leaders as regularly available and accessible to them as sources of agricultural information.

Radio was the most available/accessible mass medium for obtaining agricultural information as 81.01% of the respondents indicated its availability/accessibility. Only 28.80% of the farmers, however, indicated its regular availability/accessibility while 52.21% indicated its availability/accessibility only sometime. Television was the least regularly available/accessible source of agricultural information with only about 1% of

the farmers mentioning it as regularly available and accessible. On average, about 62% of the farmers indicated that mass media were never available and accessible to them as sources of agricultural information.

The interpersonal channels have higher relative usage by farmers than mass media. Friends/relations/neighbours (41.14%), constituted the most regularly used interpersonal channels followed by extension agents (37.02%) and then the contact farmers (22.15%). Generally, majority (66.77%) of the respondents indicated use of radio in obtaining agricultural information but only 10.44% of them indicated its regular use while 56.33% indicated that they used it only some times. Newspaper, television and film show have very low frequency of usage as 87.02, 81.01 and 76% of the respondents had respectively indicated their non-use at all as sources of agricultural information. The low or non usage of mass media could be due to low socioeconomic status of the farmers and lack of facilities such as electricity to operate them. The low or non-usage of print media such as newspapers, extension bulletins/newsletters can be attributed to low literacy level of the rural farmers. Studies that have looked at channels have found that mass media channels of communication are important in conveying information and creating awareness or changing cognitions, while interpersonal channels are more likely to cause attitude change. It has been found that radio reaches the largest audience in most developing countries (Rogers and Nichoff, 2002). Radio can reach large audience at the same time. Where cost is concerned, it is an extremely economical medium as compared to other extension media and methods involving individual and group contacts.

However, according to Ekoja (2003) television and radio play very important role in dissemination the information about agriculture for the farmer's and similarly different

newspapers which publish articles and periodicals about agriculture. Research has shown that mobile phones provide a platform to farmers for sharing and getting the information about agriculture. Farmers nowadays use mobile phones for several uses. Some use it for getting the price of product from market while others directly communicate with customers for selling their goods in better price. Furthermore, farmers use short message services (SMS) for keeping up to date about the weather as well as use of pesticides in their farms (Murthy, 2009). Aderibigbe (1990) believed that interpersonal communication is the major means of linking the rural farmers since a majority of them are illiterate. Channels such village messengers, the market place and word of mouth were found to be more popular amongst the rural people.

The farmers were asked to indicate the most preferred channels out of all listed channels made available and accessible to them. Extension agents were mentioned by majority of them (54.75%) as the most preferred channel. Radio is the most preferred channels with 17.41% of the farmers mentioning it as their most preferred channel. Friends neighbours relations and television jointly occupied the third position in the ranking order. Contact farmers came next (5^{th} position) with 6.33% of the farmers indicating it as their most preferred channel. Newspapers are also one of the most preferred channels. In fact, no farmers mentioned it as the most preferred channel.

The high preference rating for extension agents may be attributed to the interpersonal interaction and immediate feedback enjoyed by the farmers. The less preference shown for newspapers, posters/handbills and extension bulletin/news letter may be probably due to the high illiteracy level among the respondents.

2.3.4 Level of utilization of modern communication channels (ICTs and Social Media Platform).

Nenna (2016) reported that the weighted mean score (WMS) analysis on the level of utilization of ICT facilities in the study area showed that the respondents utilized mobile phones (m=2.84), radio (m=2.69), and television (m=2.30) regularly in their farming activities, since their mean scores were greater than the cut-off point of 2.00. Others were not regularly utilized in the study area since their mean scores were below the decision point. This implies that the respondents use more of conventional ICTs such as telephone, radio and television for obtaining technological agricultural information on cassava production activities more than the contemporary ICTs such as computer and internet. Another possible explanation of this could be due to various advantages attached to these ICT facilities which others do not have such as personal interaction, accessibility, maintenance, language literacy clarity and avoidance of time wasting. Satau *et al.* (2014) enumerated the strength of mobile phone as a communication tool to be language and literacy independent and the use of mobile phone can aid proper time management by avoiding the risk of traveling long distance. Satau *et al.* (2014), who reported that farmers recorded high level of usage of conventional ICTs in their work on access and application of ICT among farming household of Southeast Nigeria. Also, Oyeyinka and Bello (2013) observed that the effective use of ICTs have significant positive impacts on agricultural production, marketing and post-harvest activities that can improve the livelihood of poor rural families which in turn can contribute to poverty reduction. The position of internet is in line with the observation of Olaniyi and Adewale (2014) who reported that internet

is one of the least explored sources of information and is an indication that the respondents are still dependent on conventional sources of information.

Oto and Shimayohol (2011) reported that extension agents were mentioned by majority of them (54.75%) as the most preferred channel. 17.41% of the respondents mentioned radio as their most preferred channel. Friends/neighbours/relations and television jointly occupied the third position in the ranking order. Contact farmers came next (5th position) with 6.33% of the respondents indicating it as their most preferred channel. Newspapers was also a preferred channel. In fact, no respondent mentioned it as the most preferred channel. The high preference rating for extension agents may be attributed to the interpersonal interaction and immediate feedback enjoyed by the farmers. The less preference shown for newspapers, posters/handbills and extension bulletin/news letter may be probably due to the high illiteracy level among the respondents.

Siraj (2012) attests to the fact that rural populations are not only resource poor but also information poor. In addition, Ngwenyama, Andoh-Baidoo, Bollou, and Morawecynski (2006:4) observed that "in Africa, three quarters of the population is illiterate and lives in rural areas that lack basic facilities such as electricity and to expect effective utilisation of communication technologies like the Internet in all areas, by all people, would be unreasonable". This view is also supported by Ghatak (2007) who identified constraints such as differing literacy, poor technical skills and lack of practical digital content to the use of communication technologies. The constraints associated with the use of ICTs especially in rural areas as well as their limited access to agricultural extension agents make it necessary to consider the potential of informal information networks for improving the provision of agricultural information.

2.3.5 Effects of Socio-economic Characteristics on the Level of Utilization of Modern Communication Channels

Thomas (2014) revealed that number of times a farmer has contact with extension agent(s) was positively significant which implies a unit increase in extension agent visit will result in increase in agricultural activities. This result suggests that, a strong extension system can avail farmers technical information/advice on poultry farming activities in the rural area.

Ogolla, M. A (2016) reported that, the parameter for the age variable was -0.06751 at 1% percent significant level. This implied that, age of the farmers was negatively related to the farmers' technical inefficiency in poultry production but positively influenced the efficiency of poultry farmers of the study area. This because as the poultry farmer grows older, he gains more experience in poultry farming, which in turn gives him the ability to combine resource inputs used in poultry production in an optimal manner, given the available technology (Idiong, 2007). One other possible reasons adduced was that, the older the poultry farmer the higher the chances that he had more resources at his disposal, which included capital, family labour, buildings and land. These resources are likely to increase the technical efficiency of the poultry farmer.

The age variable parameters were significantly different from zero at 1% significant level for all the seven estates surveyed and the parameter estimates of age for the farmers in the survey had uniformly the same negative sign and were statistically significant. This implied that age positively influenced poultry production of the poultry farmers of the study area.

2.3.6 Constraints to the Use of Modern ICTs

Nenna (2016) in a study "Assessment of Information and Communication Technologies (ICTS) Among Cassava Farmers" in Anambra State, Nigeria reported that the identified constraints to the use of ICTs by cassava farmers in the study area. High cost of ICT facilities (m=3.33), and inadequate access (m=3.20), were the most serious variables considered by the respondents to have hindered their effective use of ICT facilities in the area. The enhancement of production can be brought about by improving capacity in terms of enhancing access to information, as the recent development in the field of agriculture can be readily obtained through effective and efficient use of ICT facilities. Omotoyo (2011) argues that ICTs that might benefit agricultural sector is only possible if there is universal access and the fruits of such universal access must be unlimited.

Ayanda (2013) revealed that constraints faced by farmers include irregular power supply ($x = 2.30$), lack of needed poultry information in newspapers, radio, ($x = 2.11$), and illiteracy of farmers ($x = 2.06$). Ayanda posited that constraints such as high cost of information creating gadgets (television, radio, computer), high level of poverty among farmers, readability problem among farmers, and inadequate power supply, all affect the use of mass media as source of agricultural information.

CHAPTER THREE
METHODOLOGY

3.1 Description of the study area

The study area of this research is Nasarawa State. Nasarawa State is located between latitude 8° 32^{1} 0" N of the equator and longitude 8° 18^{1} 0" E of green which meridian. Majority of the population are rural dwellers that mostly engage in agricultural production (Shuaib *et al.,* 1997). The state is characterized by two major seasons, dry and wet seasons. The wet season ranges from April to October, while the dry season ranges from November to March (Nigeria Meteorological Agency, 2008). The rainfall per annum ranges from 1000 to 1,500mm with the average of 187 to 220 rainy days with average monthly temperature ranges from 21°C and 37°C. The vegetation of the state is of the northern guinea savannah. Geographically, the state is characterized by varying land forms extensive and swampy features which are common in the lowland areas along the valleys of Benue deep valleys, large hills, mountains and Plateaus. Soil and weather patterns are favourable for the production of wide spectrum of agricultural food, industrial and cash crops of different types. The major crops grown in the state include rice, maize, yam, cassava, millet, sorghum among others.

Nasarawa State has an estimated population of 2,823,965 million people by 2017 projection with land mass area of 27,117km^{2} (National Population Census, 2006). Nasarawa State is divided into three agricultural zones namely: The Western Agricultural Zone with headquarters at Keffi, the Central Agricultural Zone with headquarters at Akwanga and the Southern Agricultural Zone with the headquarter at Obi respectively.

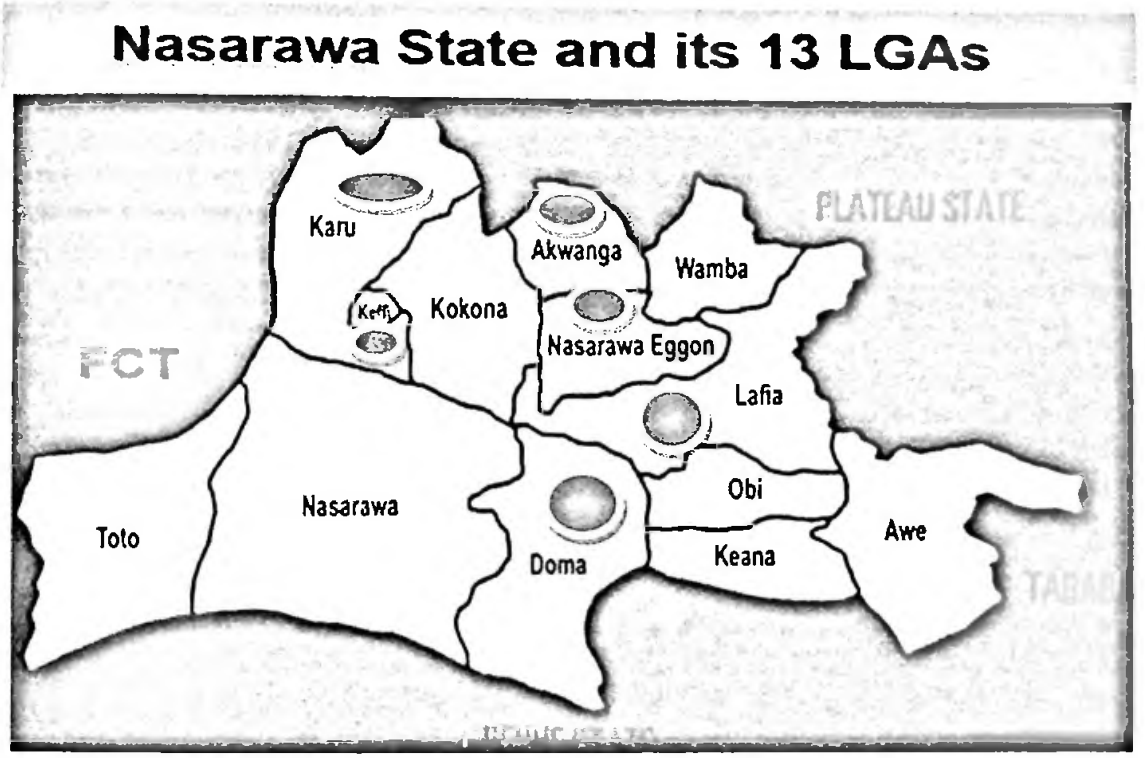


Fig. 3.1: Map of Nasarawa State showing the study area
Source: Nasarawa Geographical Information System, 2018

Key

Study area
(selected LGAs)

3.2 Sampling Technique and Sample Size

The target population of the study comprised of all actors in the poultry value chain. However, this study was limited to the analysis of communication channels and networks among the following participants in the poultry value chain:

i) Dealers of poultry inputs (Feeds, drugs and equipment)

ii) Poultry farmers (Broilers and layers producers)

iii) Marketers of poultry products

iv) Veterinarians and Poultry Advisory service providers

A multi-stage sampling procedure was used for the selection of the respondents.

Stage 1: Two (2) Local Government Areas (LGAs) well known for poultry production were purposively selected from each of the three agricultural zones in the state. These were Karu and Keffi LGAs from western zone, Akwanga and Nasarawa-Eggon from the central zone Lafia and Doma from the southern zone. This gave a total of six (6) LGAs selected for the study.

Stage 2: A preliminary survey was conducted in each of the six towns to have a census of the selected actors in the poultry value chain (see Table 3.1), thirty percent (30%) of the identified participants in each value chain category were selected using proportional sampling technique. This gave a total of 140 respondents

Table 3.1 Sampling Frame of Actors in Poultry Value Chain in the Study Area

LGAs	Poultry feeds and equipment suppliers listed	30% selected	Poultry farmers listed	30% selected	Poultry marketers listed	30% selected	Veterinarian/service providers listed	30% selected
Lafia	34	10	58	17	21	6	8	2
Doma	11	3	30	9	10	3	4	1
Nasarawa Eggon	4	1	24	7	14	4	4	1
Akwanga	11	3	34	10	14	4	5	1
Keffi	14	4	46	14	10	3	9	2
Karu	34	10	56	17	21	6	8	2
Total	**108**	**31**	**248**	**74**	**90**	**26**	**38**	**9**

Source: Reconnaissance Survey, 2018
Sample Size = 31 + 74 + 26 + 9 = **140**

3.3 Data Collection

Data were collected using a structured questionnaire to capture information related to all the objectives of the study. Information were collected on the socio-economic characteristics of the respondents, the type of information must frequently required by the various value chain actors, level of utilization of the various sources of poultry information by the respondents, the channels of communication most frequently used by the respondents, and the constraints to the use of modern ICTs for communication by the respondents.

3.4 Data Analysis

Data were subjected to both descriptive and inferential statistical analyses. The descriptive statistics such as frequency, percentage, mean scores and ranking were used to achieve objectives 1,2,3,4 and 6 while a multiple linear regression model was used to achieve objective 5. All data collected for the 6 objectives were analysed using Special Package for Social Statistics (SPSS).

3.4.1 Measurement of variables

The multiple linear regression model used is expressed as:

$$Y= a+b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 +b_6x_6+b_7x_7 + b_8x_8 +b_9x_9 + e$$

Where: and

Y= Respondent's level of utilization of modern ICTs in percentage.

a= Constant term

b_1b_2----b_9 = Regression coefficients

X_1=Age (Years),

X_2=Sex (Male = 1, Female = 0),

X_3= Level of education (No. of years spent in formal schooling),

X_4= Years of experience in poultry value chain enterprise

X_5 = Ownership of ICT facilities (Number of items owned by the respondent)

X_6 =Annual income (in naira)

X_7 = Membership of Association/Cooperative (Number of years spent in the association)

X_8 = Access to credit (Amount of loan obtained in the last 2 years in naira)

X_9 = Extension contact (Number of visits per year)

E = Error term

Level of utilization of the modern communication channels (ICTs and social media platforms

A four-point Likert type scale was employed to measure level of utilization of the modern communication channels (ICTs and social media platforms) by the respondents with response options of Very frequently used (4), Frequently used (3), Rarely used (2) and Never used (1). The mean score of the 4-point Likert rating was computed thus: 4 + 3 + 2 + 1 = 10/4 = 2.50 cut off point. This implies that any item with a mean score $\geq$ 2.5 is frequently used for business communication while any mean score < 2.5 means that the channel is rarely used.

Constraints to the use of modern ICTs for communication

A three-point Likert type scale was employed to measure constraints to the use of modern ICTs for communication. The response options and values were weighed as follows: very serious = 3, serious = 2, and not serious – 1. The mean score of the 3 point Likert rating was computed thus: 3 + 2 + 1 = 6/3 = 2 cut off point. This

implies that any item with a mean score ≥ 2 implies a serious constraint while a mean score < 2 is considered not a serious constraint.

3. 5 Validity of research Instrument

Validity is the extent to which an instrument measures what it is supposed to measure and performs as it is designed to perform. The instrument for this study was a structured questionnaire. The instrument for data collection in this study was validated by passing it through the supervisors and other experts in the Department of Agricultural Economics and Extension, Faculty of Agriculture, Lafia, Nasarawa State University, Keffi, whose independent opinions on the adequacy and relevance of the research instrument ensured that it possessed both face and content validity. Their observations were harmonized and necessary corrections effected on the instrument before data collection commenced.

3.6. Instrument reliability

The instrument was subjected to a test re-test reliability to ascertain its consistency.

The instrument was administered to Twenty (20) respondents drawn from two (2) communities of Tudun Adabu and Adudu in the Southern Agricultural zone of Nasarawa State. It was computed by calculating the correlation coefficients of the test scores that were obtained at two different times on the same respondents. The reliability coefficient can range from 0.00 to 1.00, with values of 0.70 or higher indicating acceptable reliability (George and Mallery, 2003). The product-moment correlation coefficient (r) of 0.853, 0.968, 0.886, 896, 832 and 0.896 for clusters A, B, C and D. The grand reliability coefficient of 0.889 (88.9%) was obtained. This is an indication that the instrument can be considered highly reliable. This also implies that the instrument was (88.9%) reliable.

CHAPTER FOUR
RESULTS AND DISCUSSION

Results were discussed under the following headings;

4.1 Socio-economic characteristics of the respondents in

4.2 Sources of information most frequently used by respondents

4.3 Channels of communications most frequently used by the various actors in the value chain

4.4 Level of utilization of the modern communication channels (ICTs and social media platforms) by the respondents

4.5 Effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels (ICTs and social media platforms)

4.6 Constraints to the use of modern ICTs for communication by the respondents

4.1 Socio-economic characteristics of the respondents

The Socio-economic characteristics distributions of the respondents are presented according to various actors in poultry value chain enterprises. The data for the socio-economic characteristics were analysed using Special Package for Social Statistics (SPSS).

Age distribution

The results in Table 1 show that most (54.1%) of the poultry farmers were aged above 40 years, majority (74.2%) of the poultry inputs dealers were age between 21-40 years, most 53.8% of the poultry products marketers were age above 40 years while majority (77.8%) of the veterinary workers were age between 21-40 years. The mean age of the respondents in the study area was 42 years. This implies that actors in poultry value chain enterprises in the study area were dominated by young able body individuals. At this stage of their age they could drive poultry value chain business effectively and efficiently if supported and given the conducive environment; invariably improve their farming activities. This finding agrees with that of Lanre (2016) who reported a mean age of 42.31 years of small scale poultry

farmers in Enugu state south eastern Nigeria. This is an indication that poultry businesses in the study area were dominated by young people who are active and within their productive age group.

Sex distribution

The results in Table 1 also show that majority (81.1%) of the poultry farmers were males, majority (74.2%) of the poultry inputs dealers were females, majority (69.2%) of the poultry products marketers were males while most 55.6% of the veterinary workers were females. The results show that poultry farmers and poultry products marketers had majority of the males in the study area involved in the poultry businesses while majority of the females were involved in poultry inputs and veterinary services businesses. This result implies that more men were involved in poultry farming and poultry products marketing than their women counterparts. This may be attributed to the fact that poultry farming and poultry products marketing enterprises are highly risky ventures, labour intensive which in most cases can only be handled by the men. Women were involved more in poultry inputs and veterinary services businesses than their men counterparts. This may be attributed to the fact that poultry inputs and veterinary services businesses is and less labour intensive which can be easily handled by the women.

Household Size:

The results in Table 1 reveal that majority (89.2%) of the poultry farmers had between 1-10 persons, majority (71.0%) of the poultry inputs dealers were had between 1-10 persons, majority (92.3%) of the poultry products marketers had between 1-10 persons and majority (88.9%) of the veterinary workers had between 1=10 persons. The mean household size of the respondents was 7 persons. This is an indication that the respondents had moderate household sizes. This means that most of the actors in poultry value chain business in the study area had a fairly large household size which might serve as an insurance against short fall in supply of poultry enterprise labour. Household size has a great role to play in family

labour provision in agricultural sector. The essence of household size is that it forms the basic source of farm labour in traditional system of agriculture. It is simply used as a measure of labour availability in agriculture.

Educational level of the respondents

Table 1 further show that a majority (86.5%) of the poultry farmers had one form of education or the other (HND/Degree 40.5%. ND/NCE 25.7%, secondary education 17.6%, and primary education 2.7%) while 13.5% had no formal education, 51.6% of the poultry inputs dealers had one form of education or the other (HND/Degree 22.6%. ND/NCE 6.4%, secondary education 12.9%, and Primary education 9.7%) while 48.4% had no formal education, majority (96.2%) of the poultry products marketers had one form of education or the other (HND/Degree 46.2%. ND/NCE 15.4%, secondary education 30.8%, primary education 3.8%), while 3.8% had no formal education and majority (88.9%) of the veterinary workers had one form of education or the other (HND/Degree 55.6%, ND/NCE 22.2% and secondary education 11.1%) while 11.1% had no formal education. This implies that majority of the respondents in the study area had some form of formal education. In other words, most of the poultry value chain actors in the study area were educated. This is expected to have positive influence on their decision making in poultry value chain. In a related study Adeyonu *et al.* (2016) reported that all the poultry farmers in Oyo state had one form of formal education or the other with over 50% having tertiary education.

Marital status of respondents

Results in Table 1 also show that majority (83.8%) of the poultry farmers were married, majority (74.2%) of the poultry inputs dealers were married, majority (88.5%) of the poultry products marketers were married and majority (66.7%) of the veterinary workers were married. This implies that majority of the actors in poultry value chain in the area were married and therefore expected to be engaged in reasonable occupation to be able to fend for

their families. This may be due to the fact that married actors in poultry value chain enterprises have more socio-economic needs to meet than unmarried ones.

Membership of cooperatives

Results in Table 1 below shows that majority (63.5%) of the poultry farmers were not members of any social group/cooperative society, 29.7% had between 1-5 years of membership of cooperative societies while 6.8% had between 6-10 years of cooperative membership. 54.8% of the poultry inputs dealers were not members of any social group/cooperative society while 45.2% had between 1-5 years of cooperative membership. Majority (92.3%) of the poultry products marketers were not members of any social group/cooperative society while 7.7% had between 1-5 years of cooperative membership. Majority (66.7%) of the veterinary workers were not members of any social group/cooperative society while 33.3% had between 1-5 years of cooperative membership. The results show that majority of the respondents were not members of cooperative societies. The result implies that most of the actors participating in poultry value chain in the study area may not be aware of the benefits of co-operative societies which help to pool resources together for better production and also helps provide members easy access to credit, agricultural inputs, training and sources of information and education of members. Gona *et al.* (2011) stated that membership of cooperative societies has advantages of ensuring that members derive benefits from the groups such that could not be derived individually.

Extension contact by respondents

The results in Table 1 show that majority (60.8%) of the poultry farmers had no contacts with extension workers, 37.8% had between 1-5 contacts while 1.4% had between 6-10 contacts. Majority (64.5%) of the poultry inputs dealers had no contacts with extension workers, 29.0% had between 1-5 contacts while 6.5% had between 6-10 contacts. Majority

(65.4%) of the poultry products marketers had no contacts with extension workers while 34.6% had between 1-5 contacts. Majority (88.9%) of the veterinary workers had no contacts with extension workers while 33.3% had between 1-5 contacts with extension workers.

This implies that extension contact which is supposed to be one of the main sources of agricultural information/ technologies for improved agricultural activities was insufficient in the study area. This may negatively affect farmers' level of participation in the poultry value chain activities as extension agents play critical role in increasing farmers' adoption of new ideas. This result is in accordance with the findings of Nwalieji, *et al.* (2019) who observed that inadequate extension service was one of the major constraints faced by poultry farmers in Nigeria.

Poultry enterprise experience of respondents

Results in the Table 1 below show that majority (77.0%) of the poultry farmers had between 1-10 years of experience, 48.4% of the poultry inputs dealers had between 1-10 years of experience, majority (92.3%) of the poultry products marketers had between 1-10 years of experience while majority (77.8%) of the veterinary workers had between 1-10 years of experience. The mean years of experience of the respondents in the study area was eight (8) years. This implies that most of the respondents were relatively young in poultry value chain businesses and may lack relevant experiences in the effective management of such businesses. Poultry value chain business experience is very important because it determines the ability of the operator to make effective management decision on poultry value chain business. According to Otunaiya *et al.* (2007), experience is expected to have a significant positive impact on the ability of the farmer or farm manager to make effective management decisions.

Access to credit by the respondents

The results show that majority (61.6%) of the actors in poultry value chain in the study area had no access to credit, 30.8% of actors in poultry value chain sourced their loans from cooperatives, Microfinance banks and friends while 7.6% sourced their loan from the Produce buyers/Private Money lenders.

Results in the Table 1 below further show that majority (60.8%) of the poultry farmers had no access to loan, 6.8% obtained between loan of N1,000=N200,000, 2.7% obtained between loan of N201,000=N400,000 while 1.4% obtained loan of above N400,000. Majority 90.3% of the poultry inputs dealers had no access to loan, 6.1% obtained between loan of N1, 000=N200, 000 while 3.5% obtained between loan of N201,000=N400,000. Majority 92.3% of the poultry products marketers had no access to loan while 7.7% obtained loan of above N400, 000. All 100.0% of the veterinary workers had no access to loan. The average amount of loan obtained in the last 2 years by actors in poultry value chain business was ₦109, 326:89. The amount of loan obtained by respondents was very low. This implies that respondents in the study area had difficulty in accessing loan from financial institutions. The implication of this is that it will be very difficult for actors in poultry value chain business to go into large scale business because they cannot afford necessary inputs which can enhance productivity. Bello *et al.*(2014)) in their study on Analysis of Youth Involvement in Rice Production in Lafia Local Government Area of Nasarawa State in Central Nigeria inferred that accessibility to credit would encourage farmers' involvement in agricultural production.

Poultry enterprise annual income of respondents

Results in Table 1 show that majority (68.9%) of the poultry farmers earned less than N500,000, majority (90.3%) of the poultry inputs dealers earned between N500,000-N1,000,000, majority (96.2%) of the poultry products marketers earned between N500,000-N1,000,000 while all 100.0% of the veterinary workers earned between N500,000-N1,000,000.

The mean annual income of respondents was ₦1, 586,142.50. This implies that actors in poultry value chain businesses earned reasonable income which shows that the enterprises

are viable sources of income and employment. Higher income means better food, improved nutrition, better clothing, and access to better educational facilities and declining mortality and illiteracy rates among others. Nwalieji, *et al.* (2019) observed that income of farmers help to meet their domestic and personal needs and ultimately improve their standard of living.

Table 4.1: Socio-economic characteristics of the respondents (N=140)

Variable	Poultry farmers		Poultry input dealers		Poultry product marketing		Veterinary services providers			
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Pool frequency	Pool percentage (%)
Sex										
Male	60	81.1	8	25.8	18	69.2	4	44.4	90	64.3
Female	14	18.9	23	74.2	8	30.8	5	55.6	50	35.7
Age (years)										
21-40	34	45.9	23	74.2	14	53.8	7	77.8	78	55.7
41 and above	40	54.1	8	25.8	12	46.2	2	22.2	62	44.3
Marital status										
Single	7	9.5.0	8	25.8	3	11.5	6	66.7	24	17.1
Married	62	83.8	23	74.2	23	88.5	1	11.1	109	77.9
Divorced	2	2.7	0	0.0	0	0.0	0	0.0	2	1.4
widowed	3	4.1	0	0.0	0	0.0	2	22.2	5	3.6
Household size (number of persons)										
1-10										
11-20	66	89.2	22	71.0	24	92.3	8	88.9	120	85.7
21 and above	7	9.5	8	25.8	2	7.7	1	11.1	18	12.9
Level of education	1	1.4	1	3.2	0	0.0	0	0.0	2	1.4
HND Degree										
ND/NCE	30	40.5	7	22.6	12	46.2	5	55.6	54	38.6
Secondary education	19	25.7	2	6.4	4	15.4	2	22.2	27	19.3
Primary education	13	17.6	4	12.9	8	30.8	1	11.1	26	18.5
Non-formal education	2	4.7	3	9.7	1	3.8	0	0.0	6	4.3
Poultry enterprise experience (years)	10	13.5	15	48.4	1	3.8	1	11.1	27	19.3
1-10										
11-20										
21 and above	57	77.0	15	48.4	24	92.3	7	77.8	103	73.6
Access to credit	14	18.9	10	32.3	2	7.7	2	22.2	28	20.0
No	3	4.1	6	19.4	0	0.0	0	0.0	9	6.4
Yes										
Source of credit	66	89.2	28	90.3	24	92.3	9	100.0	127	90.7
Had no access to credit	8	10.8	3	9.7	2	7.7	0	0.0	13	9.3
Cooperative										
Bank	66	89.2	28	90.3	24	92.3	9	100.0	127	90.7
Friends	3	4.1	0	0.0	1	3.8	0	0.0	4	2.8
Produce buyers	3	4.1	0	0.0	1	3.8	0	0.0	4	2.8
Amount of loan accessed (naira)	1	1.4	3	9.7	0	0.0	0	0.0	4	2.8
Did not accessed loan	1	1.4	0	0.0	0	0.0	0	0.0	1	0.9
1,000-200,000										
201,000-400,000	66	89.2	28	90.3	24	92.3	9	100.0	127	90.7
401,000 and above	5	6.8	3	9.7	0	0.0	0	0.0	8	5.8
Years of cooperative membership (years)	2	2.7	0	0.0	0	0.0	0	0.0	2	1.4
Non- membership of cooperative	1	1.4	0	0.0	2	7.7	0	0.0	3	2.1
1-10										
11-20	47	63.5	17	54.8	24	92.3	6	66.7	94	67.1
21 and above	22	29 7	14	45.2	2	7.7	3	33.3	41	29.3
Number of extension contacts (number of times)	5	6.8	0	0.0	0	0.0	0	0.0	5	3.6
Had no contacts	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1-5										
6-10	45	60.8	20	64.5	17	65.4	8	88.9	90	64.3
11 and above	28	37.8	9	29.0	9	34.6	1	11.1	47	33.6
Access to land	1	1.4	2	6.5	0	0.0	0	0.0	3	2.1
Yes	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
No										
Farm size (hectares)	74	100.0	31	100.0	26	100.0	9	100.0	140	100.0
1-5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6-10										
11 and above	73	98.6	28	90.3	23	88.5	7	77.8	131	93.6
Poultry enterprise income (amount in naira)	1	1.4	3	9.7	3	11.5	2	22.2	9	6.4
1,000-500,000	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
501,000-1,000,000										
Above 1,000,000	48	68.9	28	90.3	1	3.8	0	0.0	77	55.0
	18	24.3	2	6.5	25	96.2	9	100.0	54	38.6
	8	10.8	1	3.2	0	0.0	0	0.0	9	6.4

Source: Field survey, 2019

N = 74, 31, 26 and 9 for poultry farmers, poultry input dealers, poultry product marketers and veterinary service providers respectively.

4.2. Sources of information used by the respondents

The results in Table 2 show the sources of information used by various actors in poultry business enterprises. The results show that majority of poultry farmers got their information from the following sources: fellow farmers (62.2%), inputs dealers 58.1%, veterinary workers 54.1% short message services (SMS) 41.9%. Similarly, poultry inputs dealers got their information from the following sources: veterinary officers 74.2%, extension workers 67.7%, radio and internet 38.8% and 32.3% respectively. Poultry products marketers got their information from the following sources: fellow marketers 57.7%, veterinary workers 50.0% and inputs dealers and neighbours 42.3%. In the same vein, majority (66.7%) of veterinary workers got their information from neighbours, 55.6% from fellow veterinary workers and 44.4% from magazines and newspapers.

The results further show that magazines/newspapers and association/cooperative society accounted for 18.6% of the information sources used by the respondents. This implies that actors in the various poultry value chain businesses utilised interpersonal and informal sources of information more than the use of modern ICTs. This could be as a result of poor access and knowledge of ICT application in business communication. This result agrees with Msoffe and Ngulube (2016) who reported that majority (81%) of the information sources preferences of poultry farmers in rural areas of Tanzania were veterinary officer, poultry association and agricultural extension agents.

Table 4.2: Sources of information on poultry businesses most frequently used by respondents

Source of information	Poultry farmers		Poultry input dealers		Poultry product marketing		Veterinary services	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Veterinary officers	40	54.1	23	74.2	13	50.0	5	55.6
Inputs dealers	43	58.1	7	22.6	11	42.3	2	22.2
Radio	6	8.1	12	38.7	2	7.7	2	22.2
Internet	10	13.5	10	32.3	5	19.2	1	11.17
Neighbours	24	32.2	8	25.8	11	42.3	6	66.7
Extension workers	5	6.8	21	67.7	8	30.8	1	11.1
Mobile phone messages	31	41.9	11	35.5	4	15.4	1	11.1
Magazines/newspapers	7	9.5	4	12.9	5	19.2	1	44.4
Fellow colleagues	46	62.2	11	35.5	15	57.7	4	11.1
Television	11	14.9	7	22.6	7	26.9	1	11.1
Cooperative societies	0	0.0	2	6.5	0	0.0	1	11.1

Source: Field survey, 2019

Multiple responses allowed

4.3 Communication Channels most frequently used by respondents

The results in Table 3 show that majority (79.7%) of the poultry farmers in the study area used face-to-face communication channel most frequently, 71.6% used telephone calls most frequently while 45.9% used internet most frequently. The results further revealed that poultry inputs dealers used the following channels of communication most frequently: face-to-face communication channel 90.3%, telephone calls 80.6% and internet 35.5%. Similarly, poultry product marketers used the following channels of communication for their business transactions most frequently: face-to-face communication channel most frequently 96.2%, telephone calls 84.6% and internet 34.6%. Based on the results, veterinary workers used the following channels of communication most frequently: all (100.0%) used telephone calls, face-to-face communication channel 77.8, and internet 44.4%. This implies that face-to-face communication, telephone calls and internet were the major channels of communication frequently used by actors in poultry value chain business in the study area. The high preference rating for face-to-face interaction may be attributed to the immediate feedback enjoyed by the actors in poultry value chain business.

Farmers nowadays use mobile phones for several purposes including getting the prices of inputs/products from market while others directly communicate with customers for selling their goods in better price. Furthermore, a few literate actors in poultry business use internet for getting images and video information for use in their business. This agrees with the findings of Murthy (2009) who observed that interpersonal communication was the major means of linking the rural farmers since a majority of them are illiterate.

Table 4.3: Channels most frequently used for business communications by respondents

Channel of communication	Poultry farmers		Poultry input dealers		Poultry product marketing		Veterinary services	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Face-to-face communication	59	79.7	28	90.3	25	96.2	7	77.8
Telephone calls	53	71.6	25	80.6	22	84.6	9	100.0
Short message service (SMS)	6	8.1	6	19.4	3	11.4	1	11.1
Internet	34	45.9	11	35.5	9	34.6	4	44.4
Radio	2	2.7	4	12.9	3	11.5	1	11.1
Television	6	8.1	8	25.8	4	15.4	1	11.1
Magazines/newspapers	8	10.8	3	9.7	3	11.5	1	11.1
Emails	4	5.4	1	3.2	0	0.0	0	0.0

Source: Field survey, 2019
Multiple responses allowed

4.4 Level of utilization of modern communication channels (ICTs and social media platform) by respondents

Results in Table 4 show that the following ICT facilities were highly used for business communication by poultry farmers: telephone call ($\bar{x}$=3.4), mobile phone massages ($\bar{x}$=3.0), and radio ($\bar{x}$=2.5). The ICT facilities that were highly used for business communication by poultry inputs dealers were: phone call ($\bar{x}$=3.6) and radio ($\bar{x}$=2.6). Also, the ICT facilities that were highly used for business communication by poultry products marketers were: phone call ($\bar{x}$=3.8) and phone messages ($\bar{x}$=3.2) while the ICT facility that was highly used by veterinary officers was telephone call ($\bar{x}$=4.0). On the other hand the ICT facilities that were rarely used include television, internet and magazines/newspapers. This implies that the respondents used more of conventional ICTs such as telephone calls, phone messages and radio for obtaining agricultural information on poultry business activities more than the contemporary ICTs such as computer and internet. Another possible reason for the use of more of conventional ICTs could be due to various advantages attached to these ICT facilities which others do not have such as personal interaction, accessibility, maintenance, language literacy clarity and avoidance of time wasting. This finding is in agreement with Satau *et al.* (2014), who reported that farmers recorded high level of usage of conventional ICTs in their work on access and application of ICT among farming household of Southeast

Nigeria. Salau *et al.* (2014) enumerated the strength of mobile phone as a communication tool to be language and literacy independent and the use of mobile phone can aid proper time management by avoiding the risk of travelling long distance. Olaniyi and Adewale (2014) observed that internet is one of the least explored sources of information and is an indication that the respondents are still dependent on conventional sources of information.

Table 4.4: Level of utilization of modern communication channels by respondents

Modern communication Channels	Poultry farmers	Poultry input dealers	Poultry product marketing	Veterinary services
	Mean	Mean	Mean	mean
Radio	2.50*	2.58*	2.26	1.61
Telephone call	3.40*	3.61*	3.81*	4.00*
Phone messages	3.00*	2.42	3.23*	2.33
Magazines/Newspapers	2.11	1.50	1.96	1.00
Television	2.50*	2.10	2.20	1.99
Internet	2.31	1.81	1.90	1.11

Source: Field survey, 2019

Multiple responses allowed

Any item with mean score ≥ 2.5 implies high level of utilization while those with mean scores < 2.5 have low level of utilization.

* = High level of utilization

4.5: Effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels

Multiple linear regression analysis was used to analyze effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels by actors in poultry value chain business in the study area. The results of the regression analysis as presented in Table 4.5.1 – 4.5.4 show that the coefficient of determination (R^2) for poultry farmers was 0.588 implying that the independent variables explain 58.8% of the variability of the dependent variable. The coefficient of determination (R^2) value for poultry inputs dealers was 0.513. This indicates that the explanatory variables explained 51.3% of the variability of the dependent variable. The coefficient of determination (R^2) value for poultry product marketing was 0.461 indicating that the explanatory variables explained 46.1% of the

variability of the dependent variable. The results for veterinary officers show that the coefficient of determination (R^2) value was 0.341. This indicates that the explanatory variables explained 34.1% of the variability of the dependent variable.

The variables of annual income (sig. =0.000), level of education (sig. =0.002) and number of extension contacts (sig. =0.005) were the determinants of level of utilization of modern communication channels by poultry farmers. The variables of level of education (sig. =0.003) and poultry enterprise experience (sig. =0.003) were the determinants of adoption of ICTs for business communication by poultry inputs dealers. The variable of annual income (sig. =0.000) was the determinant of level of utilization of modern communication channels by poultry product marketers and veterinary officers.

Annual income: The variable of annual income was positive and significant at 1%. This implies that increase in income will increase the utilization of modern communication channels by respondents. As the income of the actors in poultry business increases, the tendency to procure ICT facilities becomes high. The effect of income cannot be over stressed as it guarantees affordability ICT facilities thereby leading to easy access to information. This is in line with the findings of Nenna (2016) in a study "Assessment of Information and Communication Technologies (ICTS) among farmers" in Anambra State, Nigeria. The results of the multiple linear regression used to analyze effects of respondents' socioeconomic characteristics revealed that income was significant at 5%. Nnena opined that the effect of income cannot be over stressed as the income of the cassava farmers increases, the tendency to procure ICT facilities becomes high.

Level of education: The variable of education was positive and significant at 1%. This show there exist positive and significant relationship between years of education and use of ICTs. This implies that increase in education will increase the utilization of modern communication channels by respondents. This implies that the

higher the years of education, the more knowledgeable the actors in poultry value chain business will be in the technicalities involved in the use of ICT tools. The more educated farmers are the more likely they are to adopt the ICTs for finding solutions to their poultry value chain business problems. This agrees with Lanre (2016) in a study "Socio-economic characteristics of small scale poultry farmers "Enugu State, Nigeria. The results indicates that educational level was highly significant at 5% levels and positively related to the farmers' adoption of the improved poultry management practices. The implication is that any increase or improvement in any of these variables will result to increase or higher adoption of the management practices and vice versa.

Contacts with extension workers: The variable of contacts with extension workers was positive and significant at 1%. This implies that increase in contacts with extension workers will increase the utilization of modern communication channels by respondents. Extension contact is one of the main sources of production and technologies information for improved methods of agricultural activities for farmers. The significant effect of contacts with extension workers in the study area could also result to actors in poultry value chain business having professional and technical information/advice on poultry business activities. This results agrees with Thomas (2014) who revealed that number of times a farmer has contact with extension agent(s) was positively significant which implies a unit increase in extension agent visit will result in increase in agricultural activities. This result suggests that, a strong extension system can avail actors in poultry business technical information/advice on poultry business activities in the rural area.

Poultry business experience: Poultry business experience showed a positive correlation and therefore significantly ($p<0.001$) related to ICTs utilization. The positive and significant relationship of years of poultry business experience with the utilization of modern communication channels by poultry inputs dealers indicates

that the higher the years of poultry inputs marketing experience, the more the utilization of ICTs for communication. Years of experience in poultry business will give actors in poultry value-chain business the ability to combine resource inputs used in poultry business in an optimal manner, which is likely to increase the technical efficiency of the actors in poultry value-chain business. Years of poultry value chain business experience is also very important because it determines the ability of the actors in poultry value-chain business to make effective management decision on the business and also revealed the likelihood of high productivity and good decision making which in turn increase output, income and better standard of living. This finding agrees with Lanre (2016). In his study on "Socio-economic characteristics of small scale poultry farmers" in Enugu State, Nigeria he revealed that years of experience (t-value=2.56) had positive relationship with poultry production. The implication is that any increase in years of experience will increase higher adoption of the management practices in poultry farming and vice versa, and therefore leads to the likelihood in improvement of other socio-economic statuses of the individual.

Table 4.5.1: Effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels by Poultry farmers

Explanatory variables	β-value	Standard error	t-value	Sig.
constant	0.592	0.202	2.930	0.004
Years of experience in poultry business	0.030	0.110	0.272	0.786
Annual income	0.365	0.066	5.530	0.000***
Level of education	0.149	0.047	3.184	0.002***
Age	0.046	0.097	0.470	0.639
Years of cooperative membership	-0.056	0.089	-0.628	0.531
Number of extension visits	0.265	0.093	2.846	0.005***
Amount of loan obtained	-0.147	0.092	-1.605	0.111

Y= Respondent's level of utilization of modern ICTs (in percentage).
Note: ***= Significant at 1%
Source: Field survey, August 2019
R^2 =0.588 (58.8%)

Table 4.5.2: Effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels by Poultry input dealers

Explanatory variables	β-value	Standard error	t-value	Sig.
Constant	0.592	0.202	2.930	0.004
Years of experience in poultry business	0.330	0.110	3.001	0.003***
Annual income	0.019	0.319	0.059	0.953
Level of education	0.141	0.046	3.065	0.003***
Age	0.046	0.097	0.470	0.639
Years of cooperative membership	-0.056	0.089	-0.628	0.531
Number of extension visits	0.110	0.585	0.188	0.852
Amount of loan obtained	-0.147	0.092	-1.605	0.111

Y= Respondent's level of utilization of modern ICTs (in percentage).

Note: ***= Significant at 1%

Source: Field survey, August, 2019

$R^2 = 0.513$ (51.3%)

Table 4.5.3: Effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels by Poultry product marketing

Explanatory variables	β-value	Standard error	t-value	Sig.
Constant	0.592	0.202	2.930	0.004
Years of experience in poultry business	0.030	0.110	0.272	0.786
Annual income	1.920	0.389	4.164	0.000***
Level of education	1.538	1.257	1.224	0.236
Age	0.046	0.097	0.470	0.639
Years of cooperative membership	-0.056	0.089	-0.628	0.531
Number of extension visits	0.130	1.103	0.118	0.907
Amount of loan obtained	-0.147	0.092	-1.605	0.111

Y= Respondent's level of utilization of modern ICTs (in percentage).

Note: ***= Significant at 1%

Source: Field survey, August, 2019

$R^2 = 0.461$ (46.1%)

Table 4.5.4: Effects of respondents' socioeconomic characteristics on their level of utilization of modern communication channels by Veterinary services

Explanatory variables	β-value	Standard error	t-value	Sig.
constant	0.592	0.202	2.930	0.004
Years of experience in poultry business	0.030	0.110	0.272	0.786
Annual income	0.365	0.066	5.530	0.000***
Level of education	0.466	0.561	-0.831	0.417
Age	-0.046	0.097	0.470	0.639
Years of cooperative membership	-0.056	0.089	-0.628	0.531
Number of extension visits	0.424	0.773	0.548	0.591
Amount of loan obtained	-0.147	0.092	-1.605	0.111

Y= Respondent's level of utilization of modern ICTs (in percentage).
Note: ***= Significant at 1%
Source: Field survey, August, 2019
R^2=0.341 (34.1%)

4.6: Constraints to the use of modern ICTs for business communication by the respondents

Results in Table 6 show the constraints to effective use of modern ICTs for communication by actors in poultry value chain in the study area. From the results on the Table 6 poultry farmers perceived the following as serious constraints: erratic power supply ($\bar{x}$=2.4), high cost of ICT facilities ($\bar{x}$=2.4), complexity in using ICTs ($\bar{x}$=2.2), Poor network from service providers ($\bar{x}$=2.0) and lack of internet access in the rural areas ($\bar{x}$=2.1). Poultry inputs dealers perceived erratic power supply ($\bar{x}$=2.4), high cost of ICT facilities ($\bar{x}$=2.3), complexity in using ICTs ($\bar{x}$=2.2), poor network from service providers ($\bar{x}$=2.2). The results in Table 6 further reveal that poultry products marketers perceived the following as serious constraints; erratic power supply ($\bar{x}$=2.4), high cost of ICT facilities ($\bar{x}$=2.5), complexity in using ICTs($\bar{x}$=2.2), poor network from service providers($\bar{x}$=2.3), lack of internet access in the rural areas($\bar{x}$=2.4) and lack of communication infrastructure in rural areas ($\bar{x}$=2.5). Also results show that veterinary officers perceived the following as serious constraints; erratic power supply ($\bar{x}$=2.2), high cost of ICT facilities ($\bar{x}$=2.2), poor network from service providers ($\bar{x}$=2.2) and lack of communication infrastructure in rural areas ($\bar{x}$=2.0). The results imply that all categories of actors in poultry value chain were faced with multitude of very serious constraints that reduce their use of modern ICTs to enhance their business communication. Essentially, if respondents are to benefit from rural ICTs, electricity and power supplies are absolute prerequisites to using contemporary ICT systems. This agrees with Ayanda (2013) who posited that constraints such as high cost of information creating gadgets (television, radio, computer), high level of poverty among farmers, readability problem among farmers, and inadequate power supply, all affect the use of mass media as source of agricultural information.

Table 4.6: Constraints to use of modern ICTs for business communication by the respondents

straints	Poultry farmers	Poultry input dealers	Poultry product marketing	Veterinary services
	Mean	Mean	Mean	Mean
tic power supply	2.40*	2.42*	2.40*	2.22*
ı cost of ICT facilities	2.40*	2.30*	2.50*	2.22*
ıplexity in using ICTs	2.20*	2.20*	2.20*	1.88
· network from service provider	2.03*	2.20*	2.31*	2.22*
ς of internet access in the rural areas	2.10*	1.61	2.42*	1.66
ς of communication infrastructure in l areas	1.90	1.60	2.50*	2.00*

Source: Field survey, 2019

Multiple responses allowed Decision rule: Any item with a mean score ≥ 2 implies a serious constraint while a mean score < 2 is considered not a serious constraint.

*= serious constraints

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of major findings

The broad objective of the study was to analyse the information sources and communication channels used by actors in the poultry value chain in Nasarawa state. The results revealed that that most (54.1%) of the poultry farmers were age above 40 years, majority (74.2%) of the poultry inputs dealers were age between 21-40 years, most 53.8% of the poultry products marketers were age above 40 years while majority (77.8%) of the veterinary workers were age between 21-40 years. Results show that majority (81.1%) of the poultry farmers were males, majority (74.2%) of the poultry inputs dealers were females, majority (69.2%) of the poultry products marketers were males while most 55.6% of the veterinary workers were females. Majority (86.5%) of the poultry farmers had one form of education or the other, 51.6% of the poultry inputs dealers had one form of education or the other while 48.4% had no formal education, majority (96.2%) of the poultry products marketers had one form of education or the other and majority (88.9%) of the veterinary workers had one form of education or the other. The mean years of experience of the respondents in the study area was eight (8) years. The mean annual income of respondents was ₦1, 586,142.50. The results show that majority (62.2%) of poultry farmers got their information from fellow farmers, majority 74.2% of poultry inputs dealers got their information from veterinary officers, 57.7% poultry products marketers got their information from fellow marketers while majority (66.7%) of veterinary workers got their information from neighbours.

Majority (79.7%) of the poultry farmers in the study area used face-to-face communication channel most frequently, majority (90.3%) poultry inputs dealers used face-to-face communication channel most frequently, majority 96.2% poultry product marketers used face-to-face communication channel most frequently and all (100.0%)

of veterinary officers used telephone calls most frequently. Results show that the following ICT facilities were highly used for business communication by poultry farmers: telephone call ($\bar{x}$=3.4), mobile phone massages ($\bar{x}$=3.0), and radio ($\bar{x}$=2.5). The ICT facilities that were highly used for business communication by poultry inputs dealers were: phone call ($\bar{x}$=3.6) and radio ($\bar{x}$=2.6). Also, the ICT facilities that were highly used for business communication by poultry products marketers were: phone call ($\bar{x}$=3.8) and phone messages ($\bar{x}$=3.2) while the ICT facility that was highly used by veterinary officers was telephone call ($\bar{x}$=4.0).

The regression analysis revealed that the determinants of utilization of modern communication channels for poultry farmers were the variables of annual income (sig. =0.000), level of education (sig. =0.002) and number of extension contacts (sig. =0.005). The variables of level of education (sig. =0.003) and poultry enterprise experience (sig. =0.003) were the determinants of adoption of ICTs for business communication by poultry inputs dealers. The variable of annual income (sig. =0.000) was the determinant of level of utilization of modern communication channels by poultry product marketers and veterinary officers.

The results on constraints show that poultry farmers perceived erratic power supply ($\bar{x}$=2.4), high cost of ICT facilities ($\bar{x}$=2.4) and complexity in using ICTs ($\bar{x}$=2.2) as serious constraints, poultry inputs dealers perceived erratic power supply ($\bar{x}$=2.4), high cost of ICT facilities ($\bar{x}$=2.3) and complexity in using ICTs ($\bar{x}$=2.2) as serious constraints. The results further reveal that poultry products marketers perceived erratic power supply ($\bar{x}$=2.4), high cost of ICT facilities ($\bar{x}$=2.5) and complexity in using ICTs ($\bar{x}$=2.2) as serious constraints while veterinary officers perceived erratic power supply ($\bar{x}$=2.2), high cost of ICT facilities ($\bar{x}$=2.2) and poor network from service providers ($\bar{x}$=2.2) as serious constraints.

5.2 Conclusion

Based on these major findings, it was concluded that actors in the poultry value chain activities in Nasarawa state used mainly the conventional channels of communication such as interpersonal face-to-face communication, telephone calls and mobile phone messages for their business communications. It was also concluded that the level of utilisation of modern communication facilities (ICTs) was very low. Interpersonal face-to-face communication, telephone calls and mobile phone messages were the major sources of information used for their business communications.

5.3. Recommendations

Based on the findings of this research work, it was recommended that:

i. There is need for constant power supply by the Electricity company, this will enhance efficient utilization of ICT facilities for business communication.

ii. ICT facilities should be made available government NGOs to rural farmers at affordable prices to enhance easy access and utilization of these technologies for enhanced business communication.

iii. Governments, development partners and NGOs should sponsor special ICT trainings for Poultry value chain actors so as to improve their knowledge and skills in the use of ICTs for business communication and accessing production information. The communication service providers should improve on their network services and internet access in the rural areas.

5.4 Limitations of the study

The study will be restricted to Nasarawa State and only actors in poultry value chain business formed the target respondents. The limitation of this study was finance. Funds were inadequate for the cost of materials and transportation. the field data collection took place at a time when farmers have started farming activities. This posed some limitations in terms of getting the attention of the farmers, which required several visits in some cases.

5.5. Contribution to knowledge

This study established that the mean annual income of the respondents was ₦1, 586,142.50. This implies that poultry value chain enterprises were very profitable sources of employment and poverty alleviation in both rural and urban communities. The study also revealed that actors in poultry value chain business used Mobile phones very frequently for accessing information on their business activities.

5.6. Suggestions for further study

The researcher conducted this research only in the Nasarawa State; Nigeria. It is further suggested that similar research should be conducted in the other states in Nigeria to validate the findings of this study.

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Appendix

NASARAWA STATE UNIVERSITY, KEFFI, FACULTY OF AGRICULTURE, SHABU-LAFIA CAMPUS.

This questionnaire is designed to collect data to analyze Information Sources and Communication Channels Used by Some Selected Actors in Poultry Value Chain in Nasarawa State, Nigeria. This study is being conducted in partial fulfillment of the award of masters of philosophy degree in agricultural extension. Your opinion is therefore needed for academic purpose only and will be treated confidential.

1. Interviewer's name..... 2. Questionnaire number .....

3. Date of Interview ...../...../..... 4. Community ..... 5. LGA.....

5. Name of respondent ..... 6. Phone NO.....

SECTION A: Socio-economic characteristics of respondents

- Personal characteristics

1. Sex of respondent Male [ ] Female [ ]
2. Please indicate your age as at last birthday .....
3. Marital status: 1. Single [ ] 2. Married [ ] 3. Divorced [ ] 4. Widowed [ ]
4. What is the number of people in your household? .....
5. Educational status: 1.Non-formal [ ] 2. Primary sch [ ] 3. Secondary sch [ ] 4. Diploma/NCE
   [ ] 5. HND/Degree [ ] others (specify) .....
6. How many years did you spend in formal schooling?.....
7. What is your major occupation?.....
8. Which of these Poultry value chain activities are you engaged in?
   i. Poultry farming ii. Iii.....iv.....
9. How long have you been into poultry value chain activities? .....
10. Have you ever collected loan for your poultry production? Yes [ ] No [ ]
11. If yes, mention the source: 1. Neigbours [ ] 2. Friends [ ] 3. Cooperative [ ] 4. Bank [ ] 5. Produce buyer 6. Others (specify).....
12. State the amount of credit obtained within the last 2years (in naira).....
13. Do you belong to any social group? Yes [ ] No [ ].....
14. If yes, how many years have you been a member of such social groups/cooperatives?
15. Do you have contact with extension workers? Yes [ ] No [ ]
16. If yes, how many times in a year?.....
17. Do you have access to land for your poultry business? Yes [ ] No [ ]
18. If yes, how did you acquire land for farming/poultry business? 1. Family land [ ] 2. Rented land [ ] 3. Farm on government land [ ] 4. Squatter on the land [ ] 5. Purchased the land [ ] 6. Gift [ ]
19. What is the size of your land (in ha').....
20. What is your estimated total annual income? N.....

21. What is your estimated annual income from poultry business? N.....

22. Have you received any training on poultry value addition? Yes [ ] No [ ]

23. If yes, specify.....

Section B: Source of Information most frequently used

Where do you usually obtain information/advice on your poultry business?

(Tick appropriately)

(i) Veterinary Officers [ ]

(ii) Inputs Dealers [ ]

(iii) Radio [ ]

(iv) Internet [ ] (x)

(v) Neighbors [ ]

(vi) Extension agents [ ]

(vii) Mobile phones messages [ ]

(viii) Magazine/Newspaper [ ]

(ix) Fellow colleague [ ]

(x) Television [ ]

(xi) Cooperative society [ ]

(xii) Others (specify):.....

SECTION C: Channels of communication most frequently used

Which of these channels of communication do you use for your business communication more frequently? (Tick as applicable)

(i) Face-face communication

(ii)Radio [ ]

(iii) Telephone call [ ]

(iv) Mobile phones messages [ ]

(v) Magazine/Newspaper [ ]

(vi) Internet [ ]

(vii) Television [ ]

(viii) Others (specify).....

SECTION D: Level of utilization of the modern communication channels (ICTs and social media platforms) by the respondents.

Tick appropriately

Modern communication channels (ICTs and social media platforms	**Very frequently utilized (4)**	**Frequently utilized (3)**	**Sometimes (2)**	**Not utilized (1)**
Radio				
Telephone call				
Mobile phones messages				
Magazine/Newspaper				
Television				
Internet				
Others, specify.....				

SECTION E: Constraints to the use of modern ICTs for communication by the respondents.

How serious do you consider each of the following factors as constraint to your participation in agric enterprises? (Tick appropriately).

Constraint factors	Very serious 3	Serious 2	Not serious 1
Lack of internet access in the rural areas			
Poor communication network			
Lack of communication infrastructure on which ICTs depend (cell tower site location, radio antenna, data network, installation of standard phone equipments etc).			
Erratic power supply			
Lack of adequate awareness about ICTs			
ICTs access unevenly favours urban and wealthy residents.			
Complexity in using ICTs			
High cost of ICT software and hardware			
Lack of knowledge in operating some of the modern communication equipments			
High cost of ICT facilities			
Poor knowledge/Illiteracy in handling ICTs			

Thanks for your cooperation.

Mohammed B. Maimako